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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ALGIRDAS AVIZIENIS

Appeal 2009-003592
Application 09/886,959
Technology Center 2100

Decided: October 29, 2009

Before JAY P. LUCAS, ST. JOHN COURTENAY III, and
STEPHEN C. SIU, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejections of claims 1-24, 33-38, 41-59, 61, 65-71, 73-75, and 79-83. Claims 25-32, 39, 40, 60, 62-64, 72, and 76-78 have been cancelled.¹

¹ Appellant expressly indicates that claims 25-32 and claims 39, 40, 60, and 72 have been cancelled (App. Br. 5). On page 13 of the principal Brief,

The Examiner has indicated that claim 84 is allowable. (Ans. 3). We have jurisdiction under 35 U.S.C. § 6(b). An oral hearing was held on October 6, 2009.

We Affirm.

STATEMENT OF THE CASE

Invention

Appellant's invention relates generally to robustness (i.e., resistance to failure) in computer systems. More particularly, the invention on appeal relates to an apparatus and methods for shielding and preserving computer systems, which can be substantially conventional systems, from failure. (Spec. 1).

Independent claim 1 is illustrative:²

1. Apparatus for deterring failure of a computing system;
said apparatus comprising:

Appellant specifically requests to exclude claims 62-64 and 76-78 from appeal and also offers to cancel claims 62-64 and 76-78 without prejudice. In response to Appellant's exclusion of claims 62-64 and 76-78, the Examiner cancelled claims 62-64 and 76-78 (Ans. 4). Therefore, these claims are not before us on appeal.

² We refer throughout this Decision to the claims in the corrected Claims Appendix, filed Nov. 8, 2008.

a hardware network of components, having substantially no software and substantially no firmware except programs held in an unalterable read-only memory;

terminals of the network for connection to such system;
and

fabrication-preprogrammed hardware circuits of the network for guarding such system from such failure.

References

The Examiner relies upon the following references as evidence:

Best	US 4,995,040	Feb. 19, 1991
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Algirdas Avizienis, "The N-Version Approach to Fault-Tolerant Software," IEEE, 1985, pp. 1491-1501.

Other Evidence of Record – See Evidence Appendix in Brief, page 75

1. Declaration under 37 C.F.R. §1.132 by Jean-Claude Laprie.
2. A listing of 408 issued U. S. patents which each contain, in the claims, the phrase "substantially exclusively."

The Rejections

1. The Examiner rejected claim 79 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
2. The Examiner rejected claims 2, 3, 7, 12, 19, 24, 41, 54, 61, and 65-69 under 35 U.S.C. § 112, second paragraph, as being indefinite.

3. The Examiner rejected claims 4, 16, 36, 47, 59, 66, and 82 under 35 U.S.C. § 112, fourth paragraph.
4. The Examiner rejected claims 1, 4-8, 11, 13-17, 19, 20, 42, 44, 45, 47, 48, 53, 70, and 79 under 35 U.S.C. § 102(b) as anticipated by Best.³
5. The Examiner rejected claims 2, 3, 9, 10, 12, 18, 21-24, 33-38, 41, 43, 46, 49, 50, 51, 52, 54-59, 61, 65-69, 71, 73-75, and 80-83 under 35 U.S.C. § 103(a) as unpatentable over the combination of Best and Avizienis.⁴

Groups of Claims

The arguments will be considered for each of the five aforementioned rejections in the order of their presentation.

ISSUE 1 - 35 U.S.C. § 112, first paragraph, written description

Appellant states in the principal Brief that he “concur[s] that key subject matter (‘a circuit breaker’) of a negative limitation in claim 79 was first expressly introduced into this case by the Examiner in a telephone interview.” (App. Br. 15). However, Appellant considers this conversation

³ The Examiner lists claim 54 as standing rejected under § 102 in the rejection heading on page 8 of the Answer; however, the Examiner actually rejects claim 54 under § 103 on pages 41-42 of the Answer.

⁴ See note 3 *supra*.

as constituting a citation of prior art by the Examiner and maintains that he is entitled to draft a claim to appropriately distinguish that art.

(App. Br. 27). Appellant further contends he is entitled to simply state what his invention is not and has done so in claim 79. (App. Br. 28).

Issue: Has Appellant shown the Examiner erred in finding that the negative claim limitation *wherein the apparatus is not a circuit breaker* is not supported in the original Specification? (See claim 79).

Principles of Law

“[T]he purpose of the written description requirement is to ‘ensure that the scope of the right to exclude, as set forth in the claims, does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.’” *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 920 (Fed. Cir. 2004) (quoting *Reiffin v. Microsoft Corp.*, 214 F.3d 1342, 1345 (Fed. Cir. 2000)).

Analysis - 35 U.S.C. § 112, first paragraph, written description

Regarding negative limitations, our reviewing court has determined that an express intent to confer on the claim language the novel meaning imparted by the negative limitation is required, such as an express disclaimer or independent lexicography in the written description that provides support for the negative limitation. *Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (citations omitted).

Here, Appellant has not pointed to any portion of the originally-filed Specification (including the original claims) that demonstrates an express intent to confer on the claim language the purportedly novel meaning imparted by the negative limitation *wherein the apparatus is not a circuit breaker*. Moreover, Appellant readily admits “that key subject matter (‘a circuit breaker’) of a negative limitation in claim 79 was *first expressly introduced into this case by the Examiner in a telephone interview*.” (App. Br. 15, emphasis added).

Therefore, we find Appellant has not shown the Examiner erred. Accordingly, we sustain the Examiner’s rejection of claim 79 under 35 U.S.C. § 112, first paragraph.

ISSUE 2 - 35 U.S.C. § 112, second paragraph

Appellant states in the principal Brief that the phrase “substantially exclusively” appears in more than 400 issued patents (App. Br. 23; *see also* Evidence Appendix, App. Br. 75). The Examiner concludes that the limitation *substantially exclusively made up of commercial off-the-shelf components* is indefinite. (Ans. 6).

Issue: Has Appellant shown the Examiner erred in concluding that the limitation *substantially exclusively made of commercial off-the-shelf components* is indefinite?

Principles of Law

"The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope." *In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994) (citing *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 927 F.2d 1200, 1217 (Fed. Cir.1991)). The "inquiry therefore is merely to determine whether the claims do, in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity." *In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971).

Analysis - § 112, second paragraph

At the outset, we find it immaterial whether or not the phrase "substantially exclusively" appears in various other issued patents.⁵ The issue before us is whether the limitation *substantially exclusively made of commercial off-the-shelf components* is indefinite when the disputed limitation is considered in its entirety.⁶

⁵ See Evidence Appendix in Brief, i.e., a listing of 408 issued U. S. patents which each contain, in the claims, the phrase "substantially exclusively." (App. Br. 75).

⁶ The Court of Appeals for the Federal Circuit has repeatedly reaffirmed that the term "substantial" implies "approximate." *Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1329 (Fed. Cir. 2006). See also *Playtext Products, Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 907 (Fed. Cir. 2005) ("The term 'substantial' is a meaningful modifier implying 'approximate,' rather than 'perfect.'"), citing *Liquid Dynamics Corp. v. Vaughan Co., Inc.*, 355 F.3d 1361, 1368 (Fed. Cir. 2004). In *Wilson*

Firstly, we find that what is considered a commercial off-the-shelf component can change with the passage of time to include future commercial off-the-shelf components that were never contemplated by Appellant's disclosure. Secondly, we conclude that prefacing the term "commercial off-the-shelf component" with the modifier "*substantially exclusively*" only serves to amplify the inherent ambiguity of this limitation. *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008) (emphasizing that claim language should "provide a clear-cut indication of the scope of subject matter embraced by the claim" and noting "that the patent drafter is in the best position to resolve the ambiguity in the patent claims"). This reasoning is applicable here.

Thus, we conclude it is unclear what are the particular metes and bounds of *substantially exclusively made of commercial off-the-shelf components*. Our view appears to be reinforced by Appellant's comments made during the oral hearing held on October 6, 2009:

MR. LIPPMAN: Yes. Yes, it is.

This occurrence of the word "substantially" is not in the case. This one is, "substantially exclusively." The words "substantially exclusively" are in the case but not the words

Sporting Goods, the court determined that a claimed "insert having a *substantially* circular cross-section" did not need to be *perfectly* circular [emphasis added]. *Wilson Sporting Goods*, 442 F.3d at 1328-29. Similarly, in *Playtext Products*, the court determined that the claimed "*substantially* flattened surfaces" did not require a *perfectly* flat surface. *Playtext Products*, 400 F.3d at 907.

"substantially COTS," commercial off-the-shelf components, anymore. It was taken out because the Examiner made the point that "substantially COTS" is softening an already very soft concept, COTS, commercial off-the-shelf.

JUDGE LUCAS: That's a common phrase.

MR. LIPPMAN: It's common, but not well defined.

JUDGE LUCAS: Exactly. It's common in contracting law and it's -- especially government contracting.

MR. LIPPMAN: Right.

JUDGE LUCAS: But it's got a sufficient ambiguity, a significant ambiguity. It's substantially ambiguous --

MR. LIPPMAN: I like that.

JUDGE LUCAS: -- when used in a claim. Because a claim is going to be interpreted over 20 years perhaps and --

MR. LIPPMAN: Exactly.

JUDGE LUCAS: -- what is available off the shelf at one time is not available, perhaps, later.

MR. LIPPMAN: Right.

(See Official Transcript of oral hearing held on October 6, 2009, p. 9, l. 19 — p. 10, l. 13).

In light of our aforementioned discussion, and the comments made by Appellant during the hearing, it is our view that the language *substantially exclusively made of commercial off-the-shelf components* fails to particularly point out and distinctly claim the subject matter of the invention on appeal, and thus does not reasonably apprise those of skill in the art of its scope. Accordingly, we agree with the Examiner that the aforementioned language (and its similar variations) is indefinite as recited in a subset of Appellant's claims on appeal. Because Appellant has not shown the Examiner erred, we sustain the Examiner's rejection of claims 2, 7, 12, 19, 24, 41, 54, 61, and 65-69 as being indefinite under 35 U.S.C. § 112, second paragraph.

However, we do not find the aforementioned limitation recited in claim 3 (which depends from claim 1 which also does not recite *substantially exclusively made of commercial off-the-shelf components*)... (the Examiner also originally rejected claim 27 which is now cancelled). Therefore, we reverse the Examiner's rejection of dependent claim 3 under 35 U.S.C. § 112, second paragraph.

ISSUE 3 - 35 U.S.C. § 112, fourth paragraph

Appellant states in the principal Brief that the phrase recited in the preamble of claim 1 "for deterring failure of a computing system" does not make the "system" part of the claimed combination. (App. Br. 24). To make this distinction (between the computing system being protected and Appellant's invention), Appellant has adopted the nomenclature of using the

word “such” to refer to the computing system being protected by the invention. (*Id.*).

The Examiner contends, e.g., that the recitation of “such computing system” in claim 4 is redundant and does not specify a further limitation of claim 1 (from which claim 4 depends) which recites “a computing system” in the preamble that is supported by the recitation of “such system” in the body of claim 1. (Ans. 7).

Issue: Has Appellant shown the Examiner erred in concluding that dependent claims 4, 16, 36, 47, 59, 66, and 82 fail to comply with the provisions of 35 U.S.C. § 112, fourth paragraph?

Principles of Law

35 U.S.C. § 112, fourth paragraph requires that “a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.” The Court of Appeals for the Federal Circuit has upheld the requirement for full compliance with the provisions of 35 U.S.C. § 112, fourth paragraph:

Ranbaxy correctly argues that claim 6 fails to “specify a further limitation of the subject matter” of the claim to which it refers because it is completely outside the scope of claim 2. We must therefore reverse the district court with respect to this issue and hold claim 6 invalid for failure to comply with § 112, ¶ 4.

[footnote 7 omitted]

Although the district court was reluctant to find the fourth paragraph of § 112 to be an invalidating provision, doing so does not exalt form over substance. Rather, it is consistent with the overall statutory scheme that requires applicants to satisfy certain requirements before obtaining a patent, some of which are more procedural or technical than others. *See, e.g.*, 35 U.S.C. § 102(b) & (d) (establishing statutory one-year bars to patentability); 35 U.S.C. § 111(a)(2)(C) (requiring submission of an oath by the applicant); 35 U.S.C. § 111(a)(3) (requiring submission of a fee with the application); 35 U.S.C. § 116 (requiring joint inventors to apply for a patent jointly).

Pfizer, Inc. v. Ranbaxy Laboratories Ltd., 457 F.3d 1284, 1292 (Fed. Cir. 2006).

Analysis- § 112, fourth paragraph

We begin our analysis by acknowledging that Appellant has the prerogative to be his own lexicographer. However, we are troubled by Appellant's reliance on the word "such" to refer back to a claim element previously introduced in a parent claim. In particular, we agree with the Examiner that using "such" (instead of "said" or "the") does not further limit the antecedent claim element in the parent claim. Instead, we conclude that the use of "such" actually broadens what has been previously claimed, because "such computing system" (claim 4) could be reasonably read on a different computing system (perhaps a similar computing system) than the particular "computing system" originally introduced in the preamble of

claim 1. Thus, we are persuaded by the Examiner's reasoning and find Appellant's arguments to the contrary unavailing. (*See* Ans. 7).

Therefore, we find Appellant has not shown the Examiner has erred. Accordingly, we sustain the Examiner's rejection of claims 4, 16, 36, 47, 59, 66, and 82 under 35 U.S.C. § 112, fourth paragraph.

ISSUE 4 - 35 U.S.C. § 102

We now consider the issue of whether Appellant has shown the Examiner erred in rejecting claims 1, 4-8, 11, 13-17, 19, 20, 42, 44, 45, 47, 48, 53, 70, and 79 under 35 U.S.C. § 102(b) as being anticipated by Best.

GROUPING OF CLAIMS - § 102 REJECTION

1. Appellant argues claims 1, 5, 8, and 11 as a group. (App. Br. 28). We will, therefore, treat these claims as standing or falling with representative claim 1.
2. Appellant argues claims 13, 14, 17, and 20 as a group. (App. Br. 28). We will, therefore, treat these claims as standing or falling with representative claim 13.
3. Appellant argues claims 42, 44, 45, and 53 as a group. (App. Br. 28). We will, therefore, treat these claims as standing or falling with representative claim 42.
4. We consider dependent claims 4, 6, 7, 15, 16, 19, 47, 48, 70, and 79 separately, as argued by Appellant.

We accept Appellant's aforementioned grouping of the claims. *See* 37 C.F.R. § 41.37(c)(1)(vii) ("Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.").

PRINCIPLES OF LAW

"Whether an invention is anticipated is a question of fact." *Elan Pharmaceuticals, Inc. v. Mayo Foundation for Medical Educ. and Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003) (citing *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 299, 302 (Fed. Cir. 1995)). In rejecting claims under 35 U.S.C. § 102, "[a] single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation." *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375-76 (Fed. Cir. 2005) (citation omitted).

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006). Therefore, we look to Appellant's Briefs to show error in the proffered prima facie case.

FINDINGS OF FACT - The Best reference

In our analysis *infra*, we rely on the following findings of fact (FF):

1. Best discloses an invention that "enables the construction of a fault tolerant computer system by networking groups or clusters

of computing elements with multiple communication channels.”
(Col. 3, ll. 21-24).

2. Best discloses a read only memory (ROM) device (col. 6, l. 25).
3. Best discloses:

In providing a fault tolerant system, the present invention includes hardware that performs the following functions: management of asynchronous redundant digital messages; sorting redundant messages that are received in arbitrary order; synchronization of distributed computing elements; comparison of data words of arbitrary bit length; and programmable configuration control of active channels and communication path redundancy. Further, the present invention provides a mechanism for comparing and correcting redundant messages that is independent of the physical data bus transmission rate and protocol. This feature allows operation with virtually any digital network technology.

(Col. 6, ll. 34-47).

Analysis - § 102 rejection over Best

Throughout this Decision, we only address Appellant’s arguments to the extent that they are directed to claimed subject matter. “[L]imitations are not to be read into the claims from the specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (citations omitted).

Representative claim 1 - § 102 rejection

Regarding representative claim 1, Appellant contends that the limitation “having substantially no software” clearly distinguishes over the Best patent. (App. Br. 20).

We disagree. We note that the Court of Appeals for the Federal Circuit has repeatedly reaffirmed that the term “substantial” implies “approximate.” See note 6 *supra*. Thus, we broadly but reasonably construe Appellant’s claim 1 as not precluding the use of software programs that may be held in a ROM or any other medium or firmware.

Appellant also argues that the hardware of Best does not protect operation of the Avionics software in his associated computer system, instead the software just runs the hardware (App. Br. 20). However, we note that these limitations are not recited in claim 1.

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner’s finding of anticipation for representative claim 1, and claims 5, 8, and 11 which fall therewith, as anticipated by Best.

Representative claim 13- § 102 rejection

Regarding representative claim 13, Appellant contends that Best does not disclose deterring failure of an entire computing system. (App. Br. 31-32; *see also* subsection 3 discussion pp. 21-22). Appellant proffers that

because Best teaches a system for controlling and managing redundant inter-processor communication channels, that such channels are less than an entire computing system as claimed (App. Br. 21-22).

In response, we note that Best discloses an invention that “enables the construction of a *fault tolerant computer system* by networking groups or clusters of computing elements with multiple communication channels.” (FF 1, emphasis added). The invention described by Best is directed to providing a fault tolerant system (i.e., meaning a whole, or entire system that is fault tolerant). (FF 3). Therefore, we find that by managing redundant inter-processor communication channels, failure of Best’s entire computer system is deterred.

Accordingly, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner’s finding of anticipation for representative claim 13, and claims 14, 17, and 20 which fall therewith, as anticipated by Best.

Representative claim 42 - § 102 rejection

Regarding representative claim 42, Appellant merely restates the contention that Best cannot meet the limitation that the invention guards the “entire” computing system from failure. (App. Br. 39; *see also* subsection 3 discussion pp. 21-22).

We find this argument unavailing for the same reasons discussed above regarding representative claim 13. Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner's finding of anticipation for representative claim 42, and claims 44, 45, and 53 which fall therewith, as anticipated by Best.

Claim 4 - § 102 rejection

Regarding claim 4, Appellant contends that “[i]n addition to the ‘all hardware’ limitation of base-claim 1 (SUBSECTION 1 above), claim 4 is believed to be even more strongly patentable because it defines an expanded combination that adds [*sic.*] the protected computing system.” (App. Br. 29).

In response, we find Appellant's argument is not commensurate with that which is claimed. Instead of the argued “expanded combination,” claim 4 merely recites: “[t]he apparatus of claim 1, further comprising: such computing system.” Therefore, we find Appellant has not shown error in the Examiner's finding of anticipation for claim 4.

Claim 6 - § 102 rejection

Claim 6 recites that “the circuits are not capable of running any application program.” Appellant contends that Best's circuits are controlled by software (App. Br. 30).

In response, we note that the antecedent basis for “the circuits” of claim 6 is the “fabrication-preprogrammed hardware circuits” of claim 1 that the Examiner has read on the ROM (read only memory) described in column

6 of Best (FF 2). While a ROM is certainly capable of *storing* program code, we find the ROM disclosed in Best is not capable of *running* any application program per se. Instead, we find the function of *running* code (i.e., executing code) is performed by the computer processor that fetches the executable code from a memory (e.g., a ROM) and then executes or *runs* the code. Therefore, we find Appellant has not shown error in the Examiner's finding of anticipation for claim 6.

Claim 7 - § 102 rejection

Regarding claim 7, Appellant notes that claim 7 recites the “substantially exclusively” limitation and contends that it is the software in the hosts (of Best) that is in control of the hardware, and not vice versa (App. Br. 30). Appellant points to column 3, lines 61-63 of Best that discloses global buses that are dynamically grouped under software control. We do not find Appellant's argument to be persuasive because the antecedent basis for “the circuits” of claim 7 is the “fabrication-preprogrammed hardware circuits” of claim 1 that the Examiner has read on the ROM (read only memory) described in column 6 of Best (FF 2). We broadly but reasonably construe the scope of Appellant's “fabrication-preprogrammed hardware circuits” (claim 1) to read on programmed hardware such as the ROM disclosed by Best (FF 2). We again find Appellant's argument is not commensurate with that which is claimed. Therefore, we find Appellant has not shown error in the Examiner's finding of anticipation for claim 7.

Claim 15 - § 102 rejection

Regarding claim 15, Appellant contends that Best does not disclose an “infrastructure” because the Examiner has not supported his assertion that the network of Best is an infrastructure. (App. Br. 32).

In response, we do not find Appellant’s argument to be persuasive because Appellant has not pointed to any definition in the Specification that provides an artisan notice of a departure from the ordinary and customary meaning so as to show that the Examiner’s interpretation of the term “infrastructure” is unreasonable. Absent an express intent to impart a novel meaning to a claim term, the words take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art. *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 (Fed. Cir. 2003). Because the plain meaning of the term “infrastructure” broadly represents a basic underlying framework, we agree with the Examiner’s findings as set forth on page 11 of the Answer. Accordingly, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 15.

Claim 16 - § 102 rejection

Claim 16 recites: “[t]he apparatus of claim 13, further comprising: such computer system.” (emphasis added). Appellant contends that because of the use of the word “such” that claim 16 expands the claimed combination (of claim 13 from which claim 16 depends) to incorporate the protected computing system. (App. Br. 32-33). We do not agree with Appellant for the reasons previously set forth regarding the § 112, fourth paragraph

rejection (i.e., we conclude that “such computer system” could refer to a different computer system than the protected computer system, perhaps a similar computer system). Appellant also fails to traverse the Examiner specific finding regarding col. 4, lines 1-25 of Best as set forth in the rejection of claim 16 (Ans. 11). Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 16.

Claim 19 - § 102 rejection

Appellant asserts that claim 19 is believed to be patentable by virtue of the *substantially exclusively made of commercial off-the-shelf components* limitation that is not met by the cited prior art (App. Br. 33); *see also* App. Br. subsection 9a, p. 28).

However, we find Appellant has not traversed the Examiner’s specific findings regarding col. 6, lines 10-14 of Best as set forth in the rejection of claim 19 (Ans. 12). Instead, Appellant merely asserts his “beliefs.” “Argument in the brief does not take the place of evidence in the record.” *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965) (citing *In re Cole*, 326 F.2d 769, 773 (CCPA 1964)). This reasoning is applicable here. Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 19.

Claim 47 - § 102 rejection

Claim 47 recites: “[t]he apparatus of claim 42, further comprising: such computer system.” (emphasis added). Appellant’s arguments in the principal Brief mirror those previously presented for claim 16 which recites the same language. (App. Br. 40).

We do not agree with Appellant for the same reasons previously set forth regarding claim 16. Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 47.

Claim 48 - § 102 rejection

Appellant asserts that the cited art cannot meet the limitation “not controlled by any associated host computer that is capable of running any application program.” (App. Br. 41). Appellant contends that the references are improperly combined, even though the Examiner has rejected claim 48 under § 102 over Best.

In response, we find Appellant has not traversed the Examiner’s specific findings regarding col. 6, lines 28-45 of Best as set forth in the rejection of claim 48 (Ans. 14). The combinability issue is moot, as the Examiner has rejected claim 48 under § 102. Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 48.

Claim 70 - § 102 rejection

Appellant asserts that the cited art cannot meet the limitation “not controlled by any associated host computer that is capable of running any application program.” (App. Br. 47). Appellant also contends that the references are improperly combined, even though the Examiner has rejected claim 70 under § 102 over Best.

In response, we find Appellant has not traversed the Examiner’s specific findings regarding col. 6, lines 28-45 of Best as set forth in the rejection of claim 70 (Ans. 13). The combinability issue is moot, as the Examiner has rejected claim 70 under § 102. Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 70.

Claim 79 - § 102 rejection

On page 19 of the principal Brief, Appellant states that claim 79 is argued separately, and points to subsection 8 and page 27 of the principal Brief. However, we find claim 79 is argued separately only in the context of the §112, first paragraph rejection of claim 79 (*See* App. Br. 27-28). Appellant has not traversed the Examiner’s § 102 rejection of claim 79 that found Figure 3 of Best does not incorporate a circuit breaker (Ans. 10). Appellant has therefore waived any such arguments on appeal. *See In re Watts*, 354 F.3d 1362, 1367 (Fed. Cir. 2004). Therefore, we find Appellant has not shown error in the Examiner’s finding of anticipation for claim 79.

ISSUE 4 - 35 U.S.C. § 102 CONCLUSION

For at least the aforementioned reasons, we find Appellant has not shown the Examiner erred in rejecting claims 1, 4-8, 11, 13-17, 19, 20, 42, 44, 45, 47, 48, 53, 70, and 79 under 35 U.S.C. § 102(b) as being anticipated by Best.

ISSUE 5 - 35 U.S.C. § 103

We now consider the issue of whether Appellant has shown the Examiner erred in rejecting 2, 3, 9, 10, 12, 18, 21-24, 33-38, 41, 43, 46, 49, 50, 51, 52, 54-59, 61, 65-69, 71, 73-75, and 80-83 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Best and Avizienis.

GROUPING OF CLAIMS - § 103 REJECTION

1. Appellant argues claims 50 and 71 as a group. (App. Br. 18) We will, therefore, treat claim 71 as standing or falling with representative claim 50.
2. Appellant argues claims 55 and 57 as a group. (App. Br. 19). We will, therefore, treat claim 57 as standing or falling with representative claim 55.
3. Appellant argues claims 65 and 67 as a group. (App. Br. 19). We will, therefore, treat claim 67 as standing or falling with representative claim 65.

4. We consider dependent claims 2, 3, 9, 10, 12, 18, 21-24, 33-38, 41, 43, 46, 49, 51, 52, 54, 56, 58, 59, 61, 66, 68, 69, 73, 74, 75, and 80-83 separately, as argued by Appellant.

We accept Appellant's aforementioned grouping of the claims. *See* 37 C.F.R. § 41.37(c)(1)(vii) ("Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.").

PRINCIPLES OF LAW

"What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419 (2007). To be nonobvious, an improvement must be "more than the predictable use of prior art elements according to their established functions." *Id.* at 417.

Invention or discovery is the requirement which constitutes the foundation of the right to obtain a patent . . . unless more ingenuity and skill were required in making or applying the said improvement than are possessed by an ordinary mechanic acquainted with the business, there is an absence of that degree of skill and ingenuity which constitute the essential elements of every invention.

Dunbar v. Myers, 94 U.S. 187, 197 (1876) (citing *Hotchkiss v. Greenwood*, 52 U.S. 248, 267 (1850)) (*Hotchkiss v. Greenwood* was cited with approval by the Supreme Court in *KSR*, 550 U.S. at 406, 415, 427).

Analysis - §103 Threshold Issue

The combinability of the Best and Avizienis references

We decide the threshold question of whether Appellant has shown the Examiner erred by improperly combining the Best and Avizienis references.

We have considered Appellant's arguments as set forth in the Briefs, and as further addressed in the Declaration under 37 C.F.R. §1.132 by Jean-Claude Laprie.

However, we note that in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), the Supreme Court emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art" and discussed circumstances in which a patent might be determined to be obvious. *Id.* at 401, 415 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 12 (1966)). The Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*. at 401, 416. "When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field *or a different one*. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability." *KSR*, 550 U.S. at 417 (2007) (emphasis added).

This reasoning is applicable here. We find the Examiner's proffered combination of Best and Avizienis is merely a combination of familiar elements (i.e., a network of components having terminals, circuits for operating programs to guard the system from failure, and circuits for

reacting to an error message (*cf.* claim 33)) according to known methods that yields a predictable result. We further find that both the Best and Avizienis references are directed to the same field of endeavor as the instant invention on appeal, i.e., fault-tolerant computer systems, and are thus analogous art.⁷ (*See* Best, FF 3; *see* Avizienis Title: “The N-Version Approach to Fault-Tolerant Software”).

Moreover, given the breadth of Appellant’s claims, we are not persuaded that combining the respective familiar elements of the cited references in the manner proffered by the Examiner was “uniquely challenging or difficult for one of ordinary skill in the art” (*see Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418)). Accordingly, we find Appellant has not shown the Examiner erred by improperly combining the cited references. We apply our finding that Best and Avizienis have been properly combined to each claim rejected under § 103.

⁷ Whether a reference in the prior art is “analogous” is a question of fact. *In re Clay*, 966 F.2d 656, 658-9 (Fed. Cir. 1992).

FINDINGS OF FACT - The Avizienis reference

In our analysis *infra*, we rely on the following findings of fact (FF):

4. Avizienis teaches the DEDIX system is an N-version research tool where N-version programming is defined as the independent generation of $N \geq 2$ software modules, called versions, by independent individuals or groups using wherever possible different algorithms, programming languages, environments, and tools to minimize the probability of errors at the decision points in an N-fold computation (p. 1494, 1st column, 3rd paragraph; *see also* pp. 1496-1500).
5. Avizienis teaches the detection of faulty systems and making associated recovery decisions ([. 1498, 1st column, para. 2).
6. Avizienis teaches three classes of exceptions or signals, including UNIX signals such as segmentation faults, process termination signals, and invalid system call signals (p. 1498).
7. Avizienis teaches the global executive collects error reports and exchanges error reports, and makes decisions on a new configuration based on error reports. (p. 1498).

Analysis - § 103 limitations

Independent claim 33 - § 103 rejection

Regarding claim 33, Appellant asserts that claim 19 is believed to be patentable by virtue of the *substantially exclusively made of commercial off-the-shelf components* limitation that is not met by the cited prior art (App. Br. 36). We disagree for the same reasons discussed *supra* in the context of the § 102 rejection. We also find Appellant has not traversed the Examiner's specific findings regarding how Avizienis (page 1498) also teaches this limitation (Ans. 31).

Appellant further contends that claim 33 recites protective circuits that react to an error message about incipient failure, from a hardware subsystem of the protected system; and the Official Action (pages 29 and 30) concedes that Best alone fails to "expressly" teach these features. (App. Br. 36).

However, we note that the Examiner relies on the secondary Avizienis reference (page 1498) for this teaching. (Ans. 31). The Court of Appeals for the Federal Circuit has determined that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner's legal conclusion of obviousness for claim 33.

Independent claim 50 - § 103 rejection

Regarding claim 50, Appellant again argues that Best cannot meet the limitation of deterring failure of the “entire” computing system. (App. Br. 41). We previously found the invention described by Best is directed to providing a fault tolerant system (i.e., meaning a whole, or entire system that is fault tolerant). (FF 3; *see* discussion of claim 13 *supra*). Appellant further contends that Best teaches nothing about inexact matching (App. Br. 41). However, we find the Examiner relies on Avizienis (p. 1498) for this teaching. (Ans. 43). As discussed *supra*, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner’s legal conclusion of obviousness for representative claim 50, and claim 71 that falls therewith.

Independent claim 55 - § 103 rejection

Regarding claim 55, Appellant asserts that no cited art teaches a generic infrastructure, capable of protecting virtually any computing system that can issue an error messages and handle a recovery command (App. Br. 20).

In response, we find claim 55 is silent regarding the argued “generic infrastructure,” which Appellant appears to admit on page 20 (last paragraph) of the principal Brief. Appellant has also failed to persuasively traverse the Examiner’s specific finding that Avizienis teaches or suggests error messages warning of incipient failure. (*See* Ans. 47, § 1). Instead, Appellant merely asserts that this limitation is not taught. (App. Br. 20, last paragraph). To the contrary, we find Avizienis teaches and/or suggests error messages as three classes of *exceptions* or *signals*, including UNIX signals such as segmentation faults, process termination signals, and invalid system call signals (FF 6). We find Avizienis also teaches and/or suggests error messages, because the global executive collects *error reports* (i.e., error messages) and exchanges *error reports*, and makes decisions on a new configuration based on *error reports*. (FF 7).

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner’s legal conclusion of obviousness for representative claim 55, and claim 57 that falls therewith.

Independent claim 65 - § 103 rejection

Regarding claim 65, Appellant's arguments bridging pages 22 and 23 of the principal Brief are directed to the previously addressed limitation of *substantially exclusively made of commercial off-the-shelf components*. We disagree for the same reasons discussed *supra* in the context of the § 102 rejection. Thus, we find unpersuasive Appellant's contention that this limitation distinguishes over the combination Best and Avizienis.

We note that the Examiner previously found this limitation to be taught by Best at col. 6, lines 10-14 as set forth in the rejection of claim 19 (Ans. 12). The Examiner proffers (in the rejection of claim 65) that Best discloses his system is applicable to all types of digital systems (Best, col. 6, ll. 29-61) (*See* Ans. 53). The Examiner also finds this limitation is taught or suggested by Avizienis on page 1498 (Ans. 53, ¶ 1).

In particular, we disagree with Appellant's interpretation regarding the purported scope of *substantially exclusively made of commercial off-the-shelf components*, for the reasons previously discussed regarding the rejection under 112, second paragraph. Thus, we find *substantially exclusively made of commercial off-the-shelf components* are taught or suggested by the Examiner proffered combination of Best and Avizienis for essentially the same reasons set forth by the Examiner in the Answer. See also our discussion above regarding claim 33.

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner's legal conclusion of obviousness for representative claim 65, and claim 67 that falls therewith.

Independent claim 81 - § 103 rejection

Appellant avers that claim 81 is believed to be patentable by virtue of the claimed "infrastructure." (App. Br. 49). Appellant supports this contention by referring by reference to the arguments previously presented regarding the "generic" infrastructure as described and argued on pages 21 and 22 of the principal Brief. However, we find claim 81 is silent regarding the argued "generic" infrastructure. Thus, Appellant again argues limitations that are not claimed.

Appellant also contends there is no teaching or suggestion of waiting for an error signal (App. Br. 49). As previously discussed regarding claim 55, we find Avizienis teaches or suggests this limitation (FF 6-7).

Therefore, we find Appellant has not met the requisite burden of providing evidence or argument to show error in the Examiner's legal conclusion of obviousness for claim 81.

Claims 2, 3, 9, 10, 12, and 80 that depend from independent claim 1

Because claim 10 was not argued separately in the Brief, claim 10 falls with claim 1 from which it depends (claim 1 was rejected under § 102).

Regarding claims 2, 3, 9, 12, and 80, we have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 15-19, 22-23), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims.

Claims 18, and 21-24 that depend from independent claim 13

Because claim 22 was not argued separately in the Brief, claim 22 falls with claim 13 from it depends (claim 13 was rejected under § 102).

Regarding claims 18, 21, 23, and 24, we have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 24-30), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims, as previously discussed.

Claims 34-38 and 41 that depend from independent claim 33

We have reviewed each of Appellant's arguments regarding these claims and find they are each directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*.

Regarding claim 34, we previously found the invention described by Best is directed to providing a fault tolerant system (i.e., meaning a whole, or entire system that is fault tolerant). (FF 3; *see* discussion of claim 13 *supra*). Regarding the argued "error message," Appellant argues the Best reference separately. The Examiner is relying on the combination of Best and Avizienis. As previously discussed regarding claims 55 and 81, we find Avizienis teaches or suggests error messages as claimed (FF 6-7). Therefore, we find Appellant's arguments unpersuasive.

Regarding claim 35, we find Appellant's arguments unpersuasive for essentially the same reasons set forth by the Examiner in the Answer (pp. 32-33), and also because Avizienis teaches fault detection and recovery over a spectrum of different systems (FF 4-5).

Regarding claim 36, we have addressed the issue of the claim term "such" *supra*. Therefore, we find Appellant's arguments unpersuasive.

Regarding claims 37, 38, and 41, we find Appellant's arguments unpersuasive for essentially the same reasons set forth by the Examiner in the Answer (pp. 34-36), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims.

Claims 43, 46, 49, 52, and 54 that depend from independent claim 42

We have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 24-30), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims.

Claims 51, 73, and 74 that depend from independent claim 50

We have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised upon one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 45-46), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims, as previously discussed.

Claims 56, 58, 59, 61, and 75 that depend from independent claim 55

We have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised upon one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 48-49), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims, as previously discussed.

Claims 66, 68, and 69 that depend from independent claim 65

We have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 54-55), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims, as previously discussed.

Claims 82 and 83 that depend from independent claim 81

We have reviewed each of Appellant's arguments regarding these claims and find they are directed to issues that we have previously addressed. In particular, Appellant's arguments are premised on one or more of the conceptual points argued on pages 20-28 of the principal Brief that we find unpersuasive for the reasons discussed *supra*. We also find Appellant's arguments unpersuasive for the same reasons set forth by the Examiner in the Answer (pp. 57-58), and because we find Appellant's arguments rely on an overly narrow interpretation of the claims, as previously discussed.

ISSUE 5 - 35 U.S.C. § 103 CONCLUSION

For at least the aforementioned reasons, we find Appellant has not shown the Examiner erred in rejecting claims 2, 3, 9, 10, 12, 18, 21-24,

33-38, 41, 43, 46, 49, 50, 51, 52, 54-59, 61, 65-69, 71, 73-75, and 80-83 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Best and Avizienis.

CONCLUSIONS

Based on the findings of facts and analysis above:

1. Appellant has not shown the Examiner erred in rejecting claim 79 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
2. Appellant has not shown the Examiner erred in rejecting claims 2, 7, 12, 19, 24, 41, 54, 61, and 65-69 under 35 U.S.C. § 112, second paragraph, as being indefinite. However, Appellant has shown the Examiner erred in rejecting claim 3 under 35 U.S.C. § 112, second paragraph, as being indefinite.
3. Appellant has not shown the Examiner erred in rejecting claims 4, 16, 36, 47, 59, 66, and 82 under 35 U.S.C. § 112, fourth paragraph.
4. Appellant has not shown the Examiner erred in rejecting claims 1, 4-8, 11, 13-17, 19, 20, 42, 44, 45, 47, 48, 53, 70, and 79 under 35 U.S.C. § 102(b) as anticipated by Best.
5. Appellant has not shown the Examiner erred in rejecting claims 2, 3, 9, 10, 12, 18, 21-24, 33-38, 41, 43, 46, 49, 50, 51, 52, 54-59, 61, 65-

69, 71, 73-75, and 80-83 under 35 U.S.C. § 103(a) as unpatentable over the combination of Best and Avizienis.

DECISION

1. We affirm the Examiner's decision in rejecting claim 79 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
2. We affirm the Examiner's decision in rejecting claims 2, 7, 12, 19, 24, 41, 54, 61, and 65-69 under 35 U.S.C. § 112, second paragraph, as being indefinite. However, we reverse the Examiner's decision in rejecting claim 3 under 35 U.S.C. § 112, second paragraph, as being indefinite.
3. We affirm the Examiner's decision in rejecting claims 4, 16, 36, 47, 59, 66, and 82 under 35 U.S.C. § 112, fourth paragraph.
4. We affirm the Examiner's decision in rejecting claims 1, 4-8, 11, 13-17, 19, 20, 42, 44, 45, 47, 48, 53, 70, and 79 under 35 U.S.C. § 102(b) as anticipated by Best.
5. We affirm the Examiner's decision in rejecting claims 2, 3, 9, 10, 12, 18, 21-24, 33-38, 41, 43, 46, 49, 50, 51, 52, 54-59, 61, 65-69, 71, 73-75, and 80-83 35 under U.S.C. § 103(a) as unpatentable over the combination of Best and Avizienis.

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Because we have sustained the rejection of each claim on appeal with respect to at least one ground of rejection, we affirm the Examiner's decision rejecting claims 1-24, 33-38, 41-59, 61, 65-71, 73-75, and 79-83.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

pgc

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